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# SELECTED ECONOMIC TRANSLATIONS ON CZECHOSLOVAKIA

No. 4



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## INTRODUCTION

This is a serial publication containing selected translations on all categories of economic subjects and geography. This report contains translations on the subjects listed in the table of contents below.

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# WHOLESALE PRICES IN CZECHOSLOVAKIA

/Following is a translation of the unsigned article "Spotlight on Problems of Wholesale Prices" in Politicka ekonomie (Political Economy), Vol. VIII, No. 1, Prague, January 1960, pages 72-77./

In the period 12-16 October 1959, in Tupadly near Melnik, the Institute of Economics of the CSAV /Ceskoslovenska akademie ved -- Czechoslovak Academy of Sciences/, together with the Secretariat for the state plan for research in the CSAV, arranged a workshop devoted to problems of wholesale prices.

The purpose of the gathering was to collect the results of research on the formation and effect of wholesale prices obtained thus far; to identify the most important problems requiring solution, especially in connection with the prepared reform of wholesale prices; to make appropriate practical recommendations on those questions on which agreement was reached; and to contribute, on the basis of the identified problems, to the coordination of research on wholesale prices and perhaps on prices generally.

Twenty-six workers from scientific institutes, ministries, factories, and other central organs participated in the meeting.

The basis for the workshop discussion was provided by considerable documentary material published in two numbers of Materialu Ekonomickeho ustavu CSAV /Materials of the Institute of Economics of the CSAV/ ("Prices as an Instrument of Planning," "Productivity of Labor and Prices"), and by the following presentations: M. Kocman, "On the Main Problems of Research on Wholesale Prices"; M. Popelka, "Conditions and Possibilities of Using Wholesale Prices in Planning for the State Socialist Sector"; C. Kozusnik, "Cost and Profit as Components of Wholesale Prices"; V. Janza, "Basic Problems of the Existing Price System; M. Kocman, "Stimulation of Technical Progress Through Price"; J. Typolt, "Problems of Raw-Material Prices; W. Komarek, "Problems of Expressing Value Calculations of the Effectiveness of Investment Construction in Terms of Price."

The discussion of the broad problem of wholesale prices concentrated on solving the following problems: 1) Operation of the price

system; 2) socially necessary costs and methods of determining them; 3) measuring profit in wholesale prices; 4) stimulating technical progress through price; 5) raw-material price level and its relations; 6) methods of changing to our own price base in foreign trade between socialist countries; 7) some questions of further theoretical research.

1. On problems of the operation of the price system the participants agreed that the key problem for effective use of wholesale prices is knowledge of the conditions of their effect and of their relation to planning methods. This holds true particularly for the relation of the price mechanism to direct forms of planning, and to other factors which influence the economic activity of enterprises.

Even though the discussion touched little on these problems, the view emerged that the effect of wholesale prices can be determined from an analysis of the problems connected with the law of distribution according to the quanitity and quality of labor. This law is then expressed in terms of personal and collective material self-interest.

In order to determine the effect of wholesale prices, it is necessary to analyze and evaluate factual material concerning the effect of wholesale prices in the present planning system, which is predicated on the utilization of long-term norms of plant and personal material interest.

This analysis should help clarify whether profit in wholesale prices, and the interest of economic production units in profit, is merely a technical question of planning, or whether it is objectively determined by the economic character of production in the state socialist sector.

On the basis of this analysis it will then be necessary to evaluate the existing provisions within the planning system connected with the effect of prices. Perhaps it will be necessary to recommend directions for improving the planning system from the point of view of improved the utilization of prices. At the same time, we should not overestimate the effect of wholesale prices within the planning system.

The effect of wholesale prices should be investigated especially on the basis of an analysis of the influence of prices on the structure of production programs, the structure of the consumption of means of production, the relationship of prices to direct and indirect forms of planning, to producer and consumer costs, and the effect of prices in relation to the organizational management of economic units engaged in production. All these analyses should be carried out and evaluated in the first instance at the level of the economic units engaged in production, then generalized and used by the appropriate central organs in the establishment and planning of prices as part of the operation of the price policy.

2. In solving the problem of socially necessary expenditures and the means of securing them, the participants concluded that in order for prices to function in conformity with the interests of society, it is in principle essential, in establishing prices, to proceed from the socially necessary labor expenditure of producers. In view of the fact that under

present conditions socially necessary costs can only be determined in monetary form, prices must be established on the basis of the costs of production.

For a number of reasons, costs are subject to an upward distortion in relation to socially necessary expenditures. In view of this fact, these costs, which form the basis for prices, must be subjected to economic analysis.

In principle, in using costs as the basis for the over-all price structure, it would be proper to employ the average planned costs of a particular branch for the year in which the new prices are to take effect. In determining these costs, it is recommended that the temporary influences exerted by economic enterprises operating below average, which might bring about higher costs, be disregarded, provided these influences can be removed shortly through more efficient production. Average costs, however, should not exclude the above-average costs of those enterprises the production of which is socially necessary during the period for which the prices are established and in which enterprises conditions for lowering costs substantially during this period are not present.

The members of the workshop further agreed that economic analysis is the method for determining socially necessary costs. As one of the instruments of this analysis, especially when goods produced only in one enterprise are considered, it is also proper to use the method of price comparison. This method, however, can be used only when in the particular instance there is really a connection between the particular characteristics of the goods and their costs of production.

As far as the prices of new products are concerned, price limits should be extensively employed. These should express the cost limits (including profit) which society can expend for the production of the particular good, thus assuring already in the phase of construction, of development and preparation for production, that the new product will be economical. An analysis of the economic efficacy of a new product must be considered the basic way for determining its price limit and economic rationale. Methods of price comparison may be used as one of the tools of this analysis. In establishing the price it is then necessary to consider what material self-interest producer and consumer will have in the new product in view of the estimated costs.

In view of the fact that socially necessary labor costs are expressed incompletely and in monetary form in the cost factor, costs deviate from the socially necessary costs and are distorted. It is therefore necessary to find ways of determining these distortions.

Another question which must be studied is the effect of our participation in the system of the international division of labor upon the relations of the socially necessary costs of various products, which should serve as focal points for price formation.

The following problems must also be studied further:

Establishing the level of costs as the basis for price formation in general price adjustments; finding ways of determining cost deviations in relation to socially necessary labor costs; estimating so-called total production costs; investigating the effects of the international division of labor upon the level of socially necessary costs; studying the suitability and effectiveness of prevailing methods of price formation and working out a method of economic analysis for the purpose of price formation.

3. The concept of profitableness as an instrument for determining the profit in wholesale prices (i.e., the so-called profit surcharge) raises two problems. First, the qualitative determination of profitableness, that is, to which base the profit is related, whether to wages, costs, the basic and circulating funds, etc. The second main problem concerns the magnitude of profit. From the point of view of price formation this is a real problem in establishing the general price structure, and in determining the prices of new products between periods of price-structure adjustments, as long as prices are determined by the method of comparative calculations or by methods derived from comparative calculations.

The participants in the workshop agreed that these questions can be solved definitely only by analyzing the objective effect of prices on the activity of an enterprise.

In the discussion of the basis for calculating profit, two viewpoints emerged: one, to consider costs -- the other, to consider wages -- as the basis for profit calculations. In the view of the majority, the current state of research on these questions does not allow a definite determination of the effectiveness of one or the other method. Research must therefore be given an impetus. An investigation of the basis for calculating profit must consider the consequences of any particular method of profit calculation, that is, how prices correspond to the relations of socially necessary costs, and how they relate to the most effective way of utilizing price as a means of influencing the total economic activity of an enterprise. At the same time, there was agreement that it is impossible mechanically to assume that the identical effects will result from particular profit calculations in price formation, as will result for production after the particular price, including profit, has been set.

The discussion revealed further that the use of a low rate of profit is the result of historical development and not of research on the effects of this rate of profit. In view of the fact that conditions have substantially changed through the introduction of the new planning and financing system, it will be necessary to study the effects of the rate of profit under both the old and new conditions. On the basis of our current knowledge and practical experience it seems appropriate that the rate of profit in the general price system be as low as possible, considering also the relationship to the 5-year validity of wholesale

prices and the considerable reduction in costs during this period, which means an actual increase in profit. Thus, for example, wholesale prices during the first year of operation of the price structure do not deviate too much from costs.

Besides the above-mentioned problems it will be necessary to investigate whether the rate of profit in the formation of the prices of new products, based on comparative calculations (or methods derived from comparative calculations), should be the same as that in the general price structure, or whether and in what respects it should deviate from it; whether the rate of profit in various branches and sectors should be the same or different within the general price structure; how to use effectively the magnitude of the profit rate in determining price relations (light metals--synthetics etc.).

4. In studying the effect of prices on technical development it is useful to distinguish and classify the various fields in which there are different problems of stimulating technical development. These fields are: 1) introduction of new, technically improved products; 2) development of technology and of the technical production base; 3) scientific research work related to technical development. An important question in the formation of prices of new, technically improved products is also the economic limitation of the new product.

The stimulation of new technical development through prices is, in addition to other methods and steps, specifically provided for in the recent government decision on "Principles of material self-interest in the stepped-up introduction of new technology." Let us see to what extent the approved principles solve shortcomings in the development of technology and what the conditions are in which these principles are realized.

In doing so it is important to keep in mind the effect of prices together with the other means and methods of the rectification of technical development (since these form a single entity), so that a possible insufficient effect of price can be balanced by the operation of another factor. Calculations of the price limit, derived from estimates of the effectiveness of the technical objective, must precede the realization of this objective. This calculation must be based on all the expenditures which the production of the new product actually entails. Further, it is essential to investigate the formation of price limits and their relation to the plan. The introduction of technical development funds is, according to the view of the participants in the discussion, a decided advance over the previous situation. At the same time, however, the participants called attention to the possible negative effects which should be kept in mind. Finally, it is necessary to investigate how the new planning and financing system (especially the long-term norms of material self-interest) will make possible the establishment of different rates of profit for various products while retaining the general profit structure.

5. The price structure of raw materials is of significance for the formation of the price level and price relations of branches of industry drawing upon these raw materials. An incorrect determination of the price of raw materials (especially in relation to socially necessary costs) distorts the economic estimates of the effectiveness of utilization of various raw materials in the national economy. Under the concrete conditions prevailing in the CSR /Ceskoslovenska Republika -- Czechoslovak Republic/ (in which raw materials constitute a large part of imports while finished products form a large part of exports), a correct raw-material price structure is very important in order to assure the effectiveness of the international division of labor (effectiveness of domestic production, foreign trade, development of related branches of industry).

In determining the general price level of raw materials, it is impossible, especially in view of the above-mentioned factors, to base it only on domestic production costs. It is therefore necessary to consider domestic production costs, the relationship of domestic to world prices, the price relations of different kinds of raw materials from the point of view of their consumption in related branches.

It will depend on the particular type of raw material (how much of its total consumption is imported, in what direction its consumption is developing, etc.) as to which of the above considerations, or combination of them, will predominate.

In establishing the relations between prices of various types of raw materials, we must consider the particular relation of the raw material to its further utilization and, according to the concrete conditions, allow price differentials depending on the differences in use. The sum total of these differential prices must correspond to the general price level of the given raw material. Possible differences between prices established from the viewpoint of consumption and prices established from the viewpoint of the supplier must be reconciled by one of the methods currently in use (e.g., by using two price lists, turnover tax, etc.).

Further research on raw-material prices must be directed to the relationship of domestic to foreign prices, i.e., possibilities and ways of excluding cyclical and other price movements on the capitalist world market must be studied, as must other distortions (the level of nominal wages, etc.), the use of exchange rates as comparative indicators in foreign currencies. Other problems to be studied are questions of the price structure for suppliers, i.e., the system of differential prices in relation to the effectiveness of production or of import, ways of excluding from the total sum of costs used to determine general price levels uneconomical costs of production or of import. Problems of the price of raw materials from the consumer's viewpoint must also be studied, i.e., the conditions for and methods of differential prices depending on the use of the raw material, the inclusion of transport costs in the price of products so as to show the effectiveness of

production regardless of distance from the point of origin of the raw materials. Finally, it is necessary to study the conditions for using the various methods of reconciling the price differences for suppliers and consumers.

6. In price formation it is necessary to consider the effect of price structure upon calculations of the effectiveness of investment construction. Because our present price relations do not express correctly the socially necessary costs, the use of these prices in calculating effectiveness leads to various distortions of the actual social advantage of one or another investment goal. In view of this fact, current prices should not be used in those instances when they, for other than economic reasons, deviate from necessary costs. At the same time, the effectiveness of large investment actions should be judged on the basis of the economic conditions which will prevail when the large constructions will be in full operation.

There was not complete agreement on the effect of present wholesale prices on calculations of effectiveness, since this question has not been studied sufficiently. Further research must therefore show the connection between the relationship of material and wage costs in present-day costs, and the relationship of productive and unproductive labor in the production of means of production. The solution of this problem will reveal whether it is necessary to use the so-called calculated prices, or perhaps whether to consider eliminating the differential levels of wholesale and retail prices, etc.

7. The participants in the meeting also considered how to establish foreign trade with the socialist countries on our own price basis. This goal emerged from the IX Conference of the RVHP /Rada Vzajemne Hospodarske Pomoci -- Council on Mutual Economic Assistance/. The representatives of a number of member countries see the possibility of establishing our own price basis in terms of solving the relationship of domestic, primarily wholesale, price formation to this new basis.

The question was discussed at the meeting in a narrower circle, and it was recommended that the problems of wholesale price formation and structure of the various socialist countries, and especially the problems of price relations, be studied and worked out.

In cooperating on this question with the Czechoslovak section of the Economic Commission, the following research tasks will probably emerge from a further discussion in the "Permanent commission for economic questions of the RVHP:" 1. preparation of a summary of valid principles for internal price formation within the CSR; 2. analysis of the principles of internal price formation in the other socialist countries on the basis of their research material, and generalization of the experience of these countries together with a study of ways of utilizing this experience for our needs.

8. The solution of the various questions discussed in the above paragraphs requires study of some more general questions, the most important of which are the following. 1) General problems of the

socioeconomic character of production in the state socialist sector, and the purposes of monetary relations within it, 2) General questions of the relation of value and price and their function under socialism (in this connection must be considered the problem of money under socialism). 3) The relations of wholesale prices to retail prices and to prices of agricultural products, and their interaction. 4) The origin and development of the present price structure in the CSR; general conclusions from the development of prices after the socialist revolution; determination of the concrete historical factors which made this development possible; basic directions of further development. 5) Study of general and particular characteristics in the development of the price structures of the countries of the world socialist system. 6) Monographs on the development, effect, and problems of wholesale price formation in various branches of the national economy; generalization of experience from various branches of industry and theoretical solution of problems which are peculiar to individual branches, such as questions of various physical conditions in the mining industry, especially clarification of the so-called mining allowance, and the prices and costs of related products. 7) The use of price to express labor productivity, proportions in the national economy, etc. 8) The relation of objective and subjective factors in the development of socialism is a general methodological and philosophical question which must be solved not only in connection with the above-mentioned tasks, but in connection with all the problems of a socialist economy, especially with problems of planning.

* * *

The conduct of the workshop and its results have confirmed that it generally achieved its purpose. Although the themes were too broad--a fact which in the case of a first meeting on prices was inevitable, they were well chosen. The fruitful discussion, besides producing concrete conclusions, pointed to the main direction of future research on prices, which will form one of the bases for working out the state plan for research. The workshop also showed -- and this was obvious also from the conclusions -- that it is essential to move from often a priori research to the study of concrete price problems, which will form the basis for broader theoretical generalizations.

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# THE THIRD FIVE-YEAR PLAN FOR WATER MANAGEMENT

/Following is a translation of portions of an article by J. Slaby in Vodni Hospodarstvi (Water Management), No 1, 1960, Prague, pages 5-6./

During the Third Five-Year Plan the volume of capital construction in the water-management sector will total more than twice that invested during the Second Five-Year Plan and more than three times that invested during the First Five-Year Plan. This fact points to the increasing importance of water management in our national economy and to the major contribution expected of it during the Third Five-Year Plan. The basic water management funds of the MEVH (Ministerstvo energetiky a vodniho hospodarstvi -- Ministry of Energetics and Water Management) and the KNV (Krajsky Narodni Vybor -- Regional National Committee) will increase from 35,418 billion koruny to 50,205 billion koruny, an increase of 14,786 billion koruny.

The directives of the Third Five-Year Plan show a definite reversal in the orientation of investment policies as practised up to now in the sector of water management. The focal point of investment plans and means has been transferred from power-producing water projects to large-scale-production water projects which do not produce electric power. From the administrative point of view there has been a shift away from the central authorities to the organs and organizations of the regions and districts. The share of power-producing water works in the total volume of water-management investments has been decreasing from 35% in the First Five-Year Plan to 27% in the Second. In the Third Five-Year Plan it will fall to 8.24%. In comparison with the First Five-Year Plan the investment expenditures for river-control projects will increase nearly seven times, those for canalization and purification projects 4.5 times, for water mains 3 times, and for water dams which do not produce electric power 2.5 times. Investment expenditures for water works producing power will decrease by one fifth. In comparison with the Second Five-Year Plan the investment expenditures for river-control projects will increase 6 times, for melioration projects 3.3 times, for canalization and purification 2.2 times, for water mains 1.6 times, and for water dams which do not produce power 2 times. Investment expenditures for power-producing water works will decrease to one third /of the present amount/.

The total volume of investment expenditures apportioned out of the national income for purposes of water management and its development under the administration of the MEVH and KNV will be 75% higher than during the Second Five-Year Plan, and in sanitation water management projects 82% higher. The increased volume of capital construction in

the sector of water management therefore represents, when compared with the Second Five-Year Plan, a rise which is substantially higher than the 54% rise which capital construction of the total national economy will effect during the Third Five-Year Plan.

Capital construction in the water-management sector will have to be secured by the necessary economic preparation and planning measures, sometimes by an expanded industrial production capacity and by agricultural and housing investments.

During the Third Five-Year Plan the expenditures for river control will amount to a total of 4.832 billion koruny. It is planned to regulate 1,821 km of river beds, of which 1,102 km are in Slovakia. Reservoirs providing storage for 1.434 billion cubic meters will be built 0.157 billion cubic meters of which will be stored in Slovak reservoirs.

In order to achieve a more effective use of the soil there will be an amount of 3.184 billion koruny assigned to agricultural amelioration projects. Some 189,000 hectares of agricultural land will be improved by flood control and some 71,000 hectares by irrigation. In the course of carrying out our amelioration projects we will have to strive for consistent and complex solutions and will have to coordinate them with other water management and economic measures.

During the Third Five-Year Plan 3.695 billion koruny will be spent for canalization and urban waste-water purification, 0.870 billion of which will be spent in Slovakia. The number of inhabitants connected to the system of public canalization is supposed to increase from 4,729,000 in 1960 to 5,735,000 in 1965, that is by 1,006,000. The canalization net will be lengthened by 2,500 km of canals. The number of inhabitants connected to the system of public canals is expected to increase from 32% to 40.3%. During 1961-1965 we will build 170 large urban purification plants, mostly in towns which are regional centers, in industrial towns, border towns, and spas. Large purification plants which are scheduled to begin operations are the waste-water purification plants of Prague, Prague-South, Ceske Budejovice, Plzen, Karlovy Vary, Hradec Kralove, Pardubice, Olomouc, Ostrava, Gottwaldov, and Bratislava.

By building waste-water purification plants, particularly the standard-type ones, we will be able to eliminate 400 main sources of pollution. The construction of these purification plants will be the responsibility of building enterprises specializing in the construction of water management projects.

The machine building industry will have to organize the production of machinery and equipment needed by waste-water purification plants. It will be necessary to build joint city and industrial water-purification plants in those locations where the given situation calls for them; we will have to perfect the development of boilers and steam equipment used for the purification of some industrial waste waters and

see to it that this necessary equipment is being produced in our country. The volume of purified waste water is supposed to increase from 107 million cubic meters to 310 million cubic meters yearly. In 1965, 54% of all urban waste waters are expected to be purified. In connection with the construction of waste-water purification plants it will be necessary to safeguard research activities and the exploitation of waste waters for agricultural purposes. There is a daily amount of about 2,890 cubic meters of various sediments which can be used for the production of fertilizers.

During the Third Five-Year Plan an amount of 1.495 billion korony will be devoted to the purification of industrial waste waters.

The Third Five-Year Plan calls for an outlay of 3.655 billion korony, of which 0.954 billion will be in Slovakia, for the supply of the population with water from a public supply system. The number of people connected with the public water system will increase to 6,602,000 in 1960 and to 7,927,000 in 1965. The public water system will be expanded by about 5,500 km and the capacity of the water plants will increase by about 5,700 liters per second, industry and agriculture included. It is estimated that about 7,600 km of new agricultural water mains will be laid. The number of people connected with the public water system is supposed to reach 55.7% [of the total population ?] In Bohemia the number of people connected is expected to increase from 57.3% to 64.8%, in Slovakia from 25.8% to 35%. During 1961-1965 we expect to complete the construction of the water supply nets of Jachymov, Nebanice, Flaje, Chomutov, Liberec-Jablonec, Humpolec, Pelhrimov-Pacov, Kruzbersky, Bezkydsky, Hrinova-Lucenec, Filakove, Pohronsky, Pobodrozsky, and Kosice; the Vysocany-Cakovice-Letnany-Bechovice industrial water main; the Podborany industrial water main; the Prague-Podoli water filtration plant; and the reconstruction of the water supply system of Prague. In 1965 our industry will receive a yearly water supply of 5.1 billion cubic meters of water and our population a supply of 0.6 billion cubic meters. We estimate an average daily per capita consumption of 200 liters. In view of the fact that the amount of water supplied to industry will increase about 80% in comparison to 1958, it will be necessary to use water economically in industrial plants. This will have to be done by systematically introducing water-recirculation methods. It will also be necessary to establish and regulate exact norms of water consumption, particularly in the case of large industrial consumers. We will have to reduce the excessive using and wasting of water; this must also be done by careful use and maintenance of the supply machinery and equipment.

Due to our relatively unfavorable hydrographic situation it is of utmost economic and political importance to use our water resources responsibly, and that with respect to quality and quantity. This is truly a world problem; in our case, however, it is of particular importance.

During the Third Five-Year Plan we will invest a total of 0.803 billion korony in water works which do not produce power. We will start the construction of seven new dams. For industrial purposes we will build the dams at Hracholusk on the Mze, at Terlicka on the Stonavka, at Sanc on the Ostravice, at Vel. Domasova on the Ondava, and at Ruzin on the Hornad. For the purpose of supplying the population we will build dams near Flaj on the Flaj Brook, at Mostiste on the Oslava, at Jirkov on the Bilina, at Slavice on the Moravka, at Lipt. Mara on the Vah, and at Hrinava on the Slatina. For agricultural purposes we will build dams at Rozkose on the Labe and at Teplice on the Becva. For the operation of large thermal power plants we will construct dams near Jesenice on the Ohre, near Skalka on the Ohre, and near Nechanice on the Ohre. The total volume of new reservoirs which will be put into operation will be 1.434 billion cubic meters, out of which 0.1567 billion cubic meters will be in Slovakia. The water stored in reservoirs will thereby increase from 1.37 billion cubic meters to 2.79 billion cubic meters, i.e., by 105%.

During the Third Five-Year Plan investment expenditures for the exploitation of water energy will amount to a total of 1.168 billion korony, of which 0.718 billion korony will be spent in Slovakia. The dams at Orlik, Kamyk, Kypelany, and Hricov will be completed. By constructing the hydroelectric power plants we will gain an additional amount of 637 MW of installed capacity, of which 210.5 MW will be in Slovakia. The production of electric power in hydroelectric power plants will increase from 1.95 billion kwh to 2.95 billion kwh, i.e., by 51.5%. In addition to the above mentioned water works there has been an amount of 0.577 billion korony reserved for the Wolfsthal water project on the Danube.

Our party and government attach great weight to the construction of locally important water-management projects, which are supported as much as possible by self-help and the financial resources of the local national committees and agricultural collectives in accordance with the principles approved by the Government on 30 September 1959.

The economics of the capital-construction program of the water-management sector deserve, naturally, our special attention. Before we decide on new investments it is, as a matter of principle, desirable to give preference to the modernization of existing installations. In water-management installations it will be necessary to construct model operating units which will serve as an example of modernization methods applicable to the respective production activities and will offer a rich source of experience for use in various other operational activities.

The examination of the efficiency of the investment program which was carried out according to the directions of the XI Congress of the KSC saved the national economy 13 billion korony and helped to shorten the time needed to achieve our goals by 3-4 months. It is necessary to continue consistently on this road and to keep perfecting

the method. Experience has taught us that by applying this method we can greatly shorten the time needed to reach our targets. A thorough examination is needed not only of the economic aspects of the planned projects and operations themselves, but also of the economy of the construction methods. It is necessary to judge a project also from the viewpoint of working procedures, use of materials, transportation of materials, concentration of building-industry resources, etc., in the interests of shortening the time of construction and reducing the costs of the construction process. It is always necessary to consider whether it would not be possible to suggest outdoor or semi-covered operations or the use of large prefabricated halls and standard equipment. Our own technical and technological equipment has to be examined and judged with an eye to the level of international technology, technique, and economy. Our technological workers must never forget that we can win international competitions with each of our new works and each of our new products if these works and products represent the best results of our own and of foreign research, and of our own and foreign valuable experience. It is a general economic principle of new investment programs to make maximal use of natural local conditions and of local resources and means of production. It is in this spirit that we have to exploit the experience of the Vladimir Movement for a new evaluation of capital construction in the interest of a thorough exploitation of existing operations.

In addition to the above-mentioned investment, production, maintenance, and repair tasks and problems, our workers in the water-management sector will, during the Third Five-Years Plan, also be faced with a number of economic questions.

In order to achieve an improved economy, our workers in the water-management sector will have to examine existing water-management operations and find some effective technical-organizational means to reduce the waste of water to less than 15% on the average in the water supply system, to achieve a reduction of costs of at least 10% per cubic meter of supplied water, to reduce the consumption of electric energy per cubic meter of supplied water by at least 10%, to reduce the costs per cubic meter of canal water by 2%, and to reduce the costs of building water-management installations.

Furthermore it will be necessary to consider things from the economic point of view and to take effective technical-organizational measures to attain a thorough use of basic funds, current funds, working time funds, material funds, and energetic funds.

CSO: 3555-D

# ENSURING A STEADY SUPPLY OF ELECTRICITY IN CZECHOSLOVAKIA

/Following is a translation of the article "Ensuring a Steady Supply of Electricity" by Jiri Baier in the Czech periodical Energetika (Energetics), Vol. 10, No. 1, January 1960, Prague, pages 1-3./

We are entering the jubilee year 1960, the year of the celebration of the 15th anniversary of the liberation of Czechoslovakia by the Red Army.

These 15 years have shown that, liberated from capitalism, the working people of our republic can rule themselves and can guide their economy and life incomparably better than under the rule of the bourgeoisie. The crises which occurred in our country, just as throughout the whole capitalist world, have been replaced by a continuous rise in the general level of our economy. Our industrial production is today almost 4 times as high as the highest level reached under capitalism, and Czechoslovakia has become one of the industrially most advanced countries of the world with high living and cultural standards.

Our energetics has a considerable share in this increase in industrial production. The constantly rising level of industry and agriculture places continuously higher requirements before it.

The natural development of energetics in the bourgeois republic created an unsatisfactory situation for the simple reason that individual areas were permitted to develop without any uniform guidance, without any uniform plan, but rather on the basis of a competitive struggle between the electric-power enterprises of individual areas. Naturally there was no unified electric power system. Not only that, but the distribution networks of medium and high voltage were built without any regard to their possible interconnection in the future. Indeed, they were built in such manner that such an interconnection would be impossible.

Energetics, just as other branches of industry, experienced a powerful development only through nationalization, as is conclusively shown by the results obtained up to the present time.

The old small regional electric-power systems -- if we can talk about power systems at all -- have been interconnected, a network of 110 kv has been built, and a distribution network of 220 kv has been superimposed over that. Thus we have achieved a unified administration of the power plants and networks integrated in the Department of Energetics.

The powerful development of energetics since 1945 shows that installed output more than doubled in the period 1945 to 1958, and that the production of electric power increased during these years more than 330%.

Today the production of electric power is more than 1,300 kwh per capita annually.

Less than 3/4 of all communities were electrified in 1945. Today more than 95% of them are electrified, and next year we shall complete the electrification of all communities. During the Third Five Year Plan we shall complete the electrification of the entire country.

We were able to achieve such results only through enthusiastic work free of the restraints of capitalism and supported by the political unity of all the working people, who speeded up the development of the industrial branches through their initiative.

The Third Five Year Plan, organized according to the directives of the XI Congress of the KSC /Communist Party of Czechoslovakia/, will depend on this same initiative of the working people. Within this plan we are to achieve -- and we shall achieve -- socialism in our fatherland.

The directives of the Third Five Year Plan foresee that in 1965 we shall produce 37.7 billion kwh of electric power and increase the effective capacity of power plants by 58% as compared with 1960.

During the Third Five Year Plan it will be necessary to produce 3,130 Mw in steam electric plants and thermal plants, particularly in the electric plants at Tisova, Tusimice, Ledvice, Novaky, Vernerov, and in Eastern Slovakia.

The tasks specified for the power industry during the period 1961 to 1965 are balanced by a consumption of electric power throughout our entire national economy planned so as to meet the electric-power requirements in industry, construction, transportation, agriculture, and in the home. We must unconditionally ensure these tasks.

At the same time, we must bear in mind that the consumption of electric power by the national economy may increase, probably above the level anticipated in the plan. We must be prepared for the eventuality that the consumption of electric power may continue to increase even faster, and that there will thus be even higher requirements for electric power than specified in the plans.

Our assumptions are based on the following:

1. Even though the plan is based on the present rate of increase and is supported by far-reaching calculations and scientific considerations, the initiative of the working people often exceeds all expectations and the national economy consequently develops faster than expected. The enthusiasm of people fighting for peace and building socialism can easily exceed all expectations, even such as at the present time may be considered unrealistic. And it is apparent today that the initiative of the working people is increasing rapidly. Socialist competition is experiencing a powerful upsurge, both in contracting socialist pledges on the occasion of the 42nd anniversary of the Great October Socialist Revolution, and in announcing commitments on the occasion of the 15th anniversary of the liberation of our fatherland by the Soviet army. This increased effort of our working people has been supported by the measures taken by the Party and Government for the

purpose of increasing the economic efficiency of the administration of the national economy, which made it possible for the working people to participate broadly in this administration, as well as by the directives of the Central Council of Unions concerning the development and guidance of socialist competition.

2. Principles concerning the raising of the standard of living and the economic effectiveness of our industry have been realized in recent months. This is reflected in the fact that directives have already been drawn up regarding a gradual reduction of thework week in deep mines to 40 hours at present, and for the time being to 42 hours in other branches of the economy. At the same time, it will be necessary to make better use of basic funds in our industry and thus increase its effectiveness. This, among other things, will enable us to fulfill the prerequisites for increasing living and cultural standards and for decreasing working time. Therefore it will be necessary to introduce a second shift in industry, so that production can be increased without costly investments and production costs can be reduced.

We have important tasks as regards increasing the use of electric-power installations in our industrial electric-power plants. These tasks are to large extent determined by the present deficiencies in this sector. We must now consider very seriously all measures in order to operate the entire power industry on a higher level than before. We have today in Czechoslovakia a unified system of energetics from the technical point of view, but we do not yet have a unified system of energetics from the economic and organizational point of view. While the "MEWE" power plants (i.e., those administered by the Ministry of Energetics and Water Economy) are oriented to the requirements of the unified over-all administration of the state -- to the views of the entire system of energetics, this is not so with regard to industrial power plants (i.e., power plants attached to factories). This is reflected in the fact that MEWE power plants are completely subordinated to the Czechoslovak State Directory of Energetics (Ceskoslovensky statni energeticky dispecinek), regardless of their readiness to supply power, their economic rating, or other considerations affecting the requirements of the system.

The internal interests of the MEWE electric-power plants are thus completely subordinated to the requirements of the entire system. Such a condition is the only correct one. The system of economic indices is also applied so as to keep local internal interests to the minimum. But this does not apply to industrial electric-power plants, and the Ministry of Energetics and Water Economy has not succeeded in establishing the same system of control for these power plants as the one which exists for the MEWE power plants. We must admit to ourselves that the existing regulations determining the relationship between the system of energetics, the industrial electric-power plants, and the supply of power to enterprises owning the electric power plants contributes to a state of affairs in which local views and interests are put above the views of the entire

state. This is damaging to the cause. Actually, there are no technical differences between the industrial and the MEWE electric-power plants. The fact that the industrial power plants are only technically connected with the all-state system of energetics and have a different organization and economic standing has serious implications for the entire national economy. The effect of this system on the work of the industrial electric power plants today is that about 30% of the electric-power industry in Czechoslovakia is not fully subordinated to the views and interests of the whole, but rather is based on the interests of the parent enterprise, i.e., on local points of view. This is damaging in that the technical reserves which exist in industrial electric power plants are not available organizationally and economically to the whole, i.e., to the entire energetics system.

Naturally we must draw inferences from this deficiency and determine the prerequisites for conditions in which present reserves can become a significant source for increasing electric power production, working time can be reduced, more shifts can be introduced, and norms can be exceeded. This can be done by developing the initiative of the working people.

How should we exploit these reserves in industrial electric power plants? Undoubtedly it would be incorrect to separate industrial electric power plants organizationally from their parent enterprises. These electric power plants are so closely related to their parent enterprises that this cannot be done effectively.

The only way to solve this question in conformity with the principles of a socialist economy is to subordinate fully these sources of electric power to all-state interests, i.e., to the unified state system of energetics and to the operational administration of the State Directory of Energetics (Statni energeticky dispecinek). Their economic relationship will have to be established in such manner that it will not be directed against the interests of the all-state system, but rather that the plants will support these interests and put the interests of the whole above local views. Such a system of the direct operational subordination of industrial electric power plants to the State Directory of Energetics is in conformity with the interests of the national economy. Indeed, the energetics system is responsible for supplying electricity to the entire national economy; therefore it is responsible for using fully all the reserves of electric power sources in Czechoslovakia. Energetics is a branch of industry which serves all the other branches of the national economy. Therefore the operational subordination of industrial electric power plants to the State Directory of Energetics should not take place in the interest of energetics alone, but in the interest of the national economy as a whole.

The principle of exploiting all reserves and subordinating local interests to the interests of the whole applies to all types of production and to all branches of industry. Thus it is necessary to fully implement this principle especially with regard to such production as the production of electric power. This is why it will be necessary that

the Ministry of Energetics and Water Economy use fully all the authority vested in it by the Government in administering the entire system of energetics, including industrial electric power plants, and that it take all appropriate steps to uncover and use all available reserves in industrial electric power plants. Thus it is necessary to eliminate all the shortcomings which exist in industrial electric power plants with regard to general installations. We cannot continue to allow general installations to be carried out in the wintertime and especially in the period of maximum yearly production. We must make sure that technological installations be in conformity with those of the over-all system of energetics.

When we use the maximum reserves of all MEWE and industrial electric power plants, the power industry will be able to cover completely the power requirements of the national economy, including requirements in excess of norm. On the other hand, as I have said before, it will not be possible to increase substantially above the norm the present power output. Therefore it will be necessary to emphasize during the Third Five-Year Plan a suitable distribution of the daily norm and a consumption of electric power other than during the peak period. This means that large and demanding industrial consumers of electric power will be supplied primarily in periods other than the peak period.

It will be necessary to insist that large consumers of electric power, which require little service, work mostly during the third shift. At the same time, it will be necessary to ensure a full automatization of such demanding consumers of electric power. Automation will make their night work easier. Surely we cannot agree that small motor plants with a large number of workers be active at night, and that a steel plant, which requires a relatively small number of workers, be active during periods of the maximum consumption of electric power.

Only through a seriously and carefully considered procedure applied both by the distributing enterprises and by the industrial consumers of electric power will it be possible to schedule properly the daily supply norm of electric power, to ensure a sufficient amount of electricity for the entire national economy, and thus also a full use of basic funds in energetics and other branches of industry. This principle will contribute to an increase of production in all branches of industry and will therefore also contribute to a raising of the level of our economy and of the standard of living of our people.

Only by ensuring fully the demanding tasks mentioned above can we open the way toward developing the initiative of our working people and promoting our national economy. Let us thus enter the jubilee year 1960 fully resolved to implement these tasks in a realistic way. Thus we shall also contribute to a speedier further development -- towards Communism.

CSO: 3555b-D

# THE USE OF HEATING OIL IN PRODUCING MARLS IN CEMENT WORKS

/Following are excerpts from an article by Jaroslav Zahalka in the Czech periodical Energetika (Energetics), Vol. X, No. 1, January 1960, Prague, pages 20-21./

The oils used are distillation residues commercially described as types A and M. Both these types of oil are not substantially different, as is shown in the following table:

| | Oil A | Oil M |
|---|---|---|
| Viscosity | about 2° E at 100° C | about 4° E at 100° C |
| Specific weight | 1.035 kg/1 | 0.946 kg/1 |
| Heating power | 9,150 kcal.kg | 9,250-9,750 kcal/kg |
| Solidification point | 25-30° C for both oils | |

The inflammation point in an open container varies between 150 and 215° C for both oils.

The sulphur content varies between 0.7 and 1.9% for both oils.

The oils contain about 0.3% of solid substances. These are residues of brown coal coke containing up to 50% cinders.

Both types of oil are suitable for producing cement. They are supplied by the Stalin National Enterprise, Zaluzi u Mostu.

* *

The centrifugal pumps which convey oil to the jets of the burners have in our case the following specifications:

Q = 250 1/min H = 170 m n = 2,900/min

One pump is always kept active and one is kept in readiness. The pumps are manufactured by the Sigma National Enterprise. They proved very satisfactory in use.

* *

One of the basic shortcomings of oil heating is the high price of the oil itself -- 330 Kcs/ton.

CSO: 3609-D

# RESULTS AND PROSPECTS OF CZECHOSLOVAK SCIENCE

/Following is a translation of an address by Prof. Eng. Dr. Jaroslav Kozesnik at the XI General Session of the CSAV published in Veda a zivot (Science and Life), No. 1, Prague, January 1960, pages 1-2./

One of the principal directives for the preparation of the 5-year plan requires that the natural, technical, and social sciences develop properly ahead of production, so as to ensure the further development of the determining branches of national economy. These branches are in particular the raw-materials and material-supply branches of industry, especially those concerned with fuels, metallurgy, and chemistry, and secondly the branches of machine construction, building, transportation, and agriculture. At the same time, it is necessary to exploit fully the natural and economic conditions of all areas and to arrive at a gradual balancing of their economic and cultural levels, and also to take advantage of the great opportunities of cooperation among the countries of the socialist camp. The directives of the Third Five-Year Plan put great stress on theory. But we have a shortage of theorists. Of course, we cannot be satisfied permanently with such a state of affairs and theoretical education must become our task of the first order. It will be necessary to use complex groups to work out vast assignments such as, for example, the problems of atmospheric pollution resulting from industrial discharges or water pollution caused by industrial waste. We have to proceed with much greater energy to do research work with semi-conductors and other modern material. Research work on the physical properties of metals must create the prerequisites for handling the production of metal material of new and better qualities. In organic chemistry, it is necessary to study the raw material basis, particularly coal and crude oil, and in biochemistry we must study the natural polymers in order to obtain a deeper knowledge of the chemical structure and changes of proteins and nucleic acids and to make it possible to influence the development of living organisms by interfering with their replacement of substances. In the field of physical chemistry, our new serious task is the thermodynamic study of the methods of capturing sulphuric oxide from smoke gases and basic research on the primary electro-chemical sources of electric current. Geology and inorganic chemistry will have a greater share in expanding and exploiting the reserves of the most important raw materials. Biological sciences hold a particularly responsible position at the present time. Biological research must ensure the healthy development of the man and the nutrition of our people in accordance with modern findings in the field of health.

It must contribute to the understanding and control of living matter and the laws guiding its movements. In addition to being helped by biological sciences, agricultural sciences must also be assisted by physics, chemistry, technical sciences, and economics. In the area of technical sciences, it is necessary to solve problems connected with changes resulting from the use of new construction and building materials and new concepts of buildings, machines, and installations. An urgent task is the fundamental modernization of technology, the purpose of which is to achieve the greatest degree possible of mechanization and automation of the production process. It is also necessary to specify the outlook of our energetics industry and to develop broadly the peaceful use of atomic energy.

The directives of the Third Five-Year Plan contain also the most important tasks of social sciences which are solving problems of the revolutionary reconstruction of our society in the spirit of the XI. Congress of the KSC /Komunisticka strana Ceskoslovenska -- Communist Party of Czechoslovakia/. Political economy will be aimed at studying long term tendencies in areas of the development of productive forces, development of production relationships which are growing from the socialistic to the communistic, and at studying the development of the socialist world economic system. Important tasks are assigned to our philosophy in developing categories of dialectic and historical materialism and in studying the laws of the development of the superstructure which accompanies the building of socialism and communist in Czechoslovakia. The sciences of government and law will deepen the study of questions of socialist democracy and of the question of broader participation of the working people in guiding the state and the national economy.

However, it is necessary to fulfill several conditions, so that the Academy and the entire scientific life of our state will develop lawfully in such a way that they would acquit themselves well at the new, higher degree of development to which our society is heading. The main question seems to be the scientific level of our workers and thus also the question of their education and, in a broader sense, the question of the education of the young age groups of scientists in general. To look for, to educate, and to guide young scientific workers is the main problem. Therefore it is necessary to discard any chance selections, any stereotyped ways in the educational process. Science's share in the development of productive forces will keep increasing, science will continue to have a more and more explicit part in completing vast changes in the relationships of production and social life. Therefore, it is assumed that the number of scientific workers will continue to increase. The proposal of principles for the development of a base for science and research anticipates for example that the number of research workers will increase by one quarter until 1965 and by one half until 1975, as compared to the number of today.

In the Institute of Mathematics of the CSAV /Ceskoslovenska Akademie Ved -- Czechoslovak Academy of Sciences/ new results have been obtained in some theoretical disciplines, particularly in the theory of probability, stability, etc. Astronomers succeeded in registering the time evolution of the joint spectrum of a solar eruption and for the first time in the whole world they succeeded in determining the places where meteorites would fall on the basis of measurements and calculations made in advance. The meteorites have subsequently been found. The Institute of Technical Physics of the CSAV completed successfully its work on large, high-performance, rectifying diodes, which have been put into production. The Institute worked in the field of ferrites and ion crystals, studied plasticity and aging of metal crystals, thermoluminescence, etc. In the Physical Institute of the CSAV, attention was focused on the use of electroluminescence in long distance signaling in connection with the studies of laws governing the conversion of various forms of energy into light energy, and experience gained in preparing electroluminescent powder layers was passed on to industrial production. The Institute also studied the possibility of using electroluminescent substances as memory elements for calculating machines. Our geophysicists completed a map of corrections of the force of gravity and geomagnetic maps. A new type of field magnetometer was released for practical application. It will be used in search of mineral deposits. The optical laboratory gave the industry, for example, a method of calculating the forms of surfaces of a single as well as a combined lens, and a method of measuring the focal distances of parabolic mirrors of high luminosity. The laboratory also achieved good results in the field of radar and infrared techniques.

Experimental work with brown coal continued in the Chemical Institute of the CSAV. This research was concerned with the use of brown coal as a chemical raw material. Research work on the use of aromatic raw material bases was carried out to complete experiments with methods which make it possible to convert impure raw material of lower quality into phenol and cresol. Work is being completed on the preparation of new insecticides. Biochemical research work on cancer and research concerning the chemical structure of albumins continued successfully. Field experiements confirmed that new types of vegetable stimulants have been exceptionally effective. An example of good cooperation between science and practice are the results of the work of the Mineral Division of the Institute of Inorganic Chemistry of the CSAV. The purpose of this research is to expand and intensify the use of domestic raw material reserves for the chemical industry. In the Institute of Macromolecular Chemistry, a method was found to prepare a new, exceptionally resistant polyamide, and the results of new experiments confirmed fully the advantages of the new method of obtaining cellulose from wood.

In the Polarographic Institute of the CSAV, very important results were obtained in the field of theory. Several analyzers were constructed, e.g., instruments for measuring imperceptible concentrations of sulphurous acid in the atmosphere. This will be important in studying industrial

discharges. The analytical laboratory completed among other things the development of an automatic industrial warning system, constructed on the principle of gas chromatography. The Biological Institute worked out a proposal on making a biosynthesis of albuminous fodder from sulphite refuse by a continuous method. A bacterial preparation to exterminate harmful insects was put into industrial production. Manufacturing technology was readied to make a growth stimulant which has been manufactured so far only in USA and in England. Viruses of infectious sterility of hops have been identified, and a virus carried by mosquitos which was unknown up to now was isolated through cooperation with Slovak experimental workers. The Virological Institute studied among other things cases of tick encephalitis, and the Biophysical Institute continued research on illnesses due to radiation. The Mining Institute examined the possibility of introducing walling /coal cutting method/ in a huge brown coal seam by means of artificial ceilings and intermediate ceilings. Present results indicate that by this method it will be possible to increase the production of coal by about one fifth.

The work of the Institute for Electrotechnology was centered primarily on the theoretical bases for establishment of a power distribution network of 400,000 V, particularly on the construction of large transformers. The Institute for Mechanical Research carried out successful experiments with burning coal at low temperatures in water by means of from the air. It also worked out a methodology for measuring vibrations of machine frames by using model machines. The Institute of Theory of Information and Automation solved some probabilistic problems of cybernetics resulting from the study of practical questions in the field of automation and transmission of information. The institute also introduced a calculation service by using the "Ural" machine. The Institute of Vacuum Electronics discovered the reason why electrons injected into circular accelerators were intercepted. Thus it was possible to solve problems which have been studied by various institutions for almost 20 years. The institute also offered effective assistance in the manufacturing of betatrons. The results of research carried out by the Institute of Theoretical and Applied Mechanics with regard to reinforced concrete constructions made it possible to save more than one tenth of high-quality construction steel. In addition, the institute continued to introduce insulating plastics in construction work. The Archeological Institute concentrated its attention on a new concept of the Slavic Era in carrying out its principal assignment, the "Ancient History of Czechoslovakia". When studying the earlier Stone Age, the institute obtained bases for periodization as well as for identification of the oldest forms of agriculture and social relations in the primitive society. The Historical Institute continued its work on the "Survey of Czechoslovak History", the fourth volume of which has been completed. Important work was done also in the Economic Institute and in the Law Institute. This work covered particularly questions of social democracy

and problems of governmental administration of agricultural production. The Philosophical Institute is completing the first part of the anthology of the history of Czechoslovak philosophy. The Institute for the Czech Language continued to publish the Dictionary of the Literary Czech Language and to work on a manuscript of the Dictionary of the Old Czech Language. The Institute for Czech Literature delivered for printing the second part of the History of Czech Literature, so that the entire work will be completed by 1961. An Old-Slavic Dictionary began to be published by the Slavic Institute, and work has started on the History of our Relations With Countries of the Socialist Camp. The Czechoslovak-Soviet Institute speeded up its work on the last part of the Great Russian-Czech Dictionary. The Oriental Institute put into print a manual of colloquial Chinese and worked on a Czech-Chinese dictionary.

This survey is of course only an incomplete enumeration of the successes achieved by institutes of the CSAV. Their scientific level increases each year. The activity of the academy's institutes represents an important contribution to the development of our economy and culture. An institute, a laboratory, an office, those are places where science assumes its real living form, places where a discovery may be born which may have revolutionary significance and become a real force of our production, bringing about a sudden move forward. Our efforts will concentrate on this aim to achieve a greater efficiency in directing and coordinating science, to find new methods of work which must be in harmony with the rapid rate of development of science and must correspond to a new higher level and dynamics of our socialist life.

CSO: 3547a-D

# INCREASING AND RENDERING ECONOMICAL MAGNESITE MINING AND MAGNESITE-BRICK PRODUCTION

/Following is a translation of an article by Michal Hanko in the Czechoslovak periodical Rudy (Ore), Vo. 8, No. 1, January 1960, Prague, pages 1-2./

In accordance with the decisions of the XI Congress of the Communist Party, heavy industry will receive priority in the coming five-year plan. Ferrous metallurgy will experience a specially accelerated expansion. The production of steel will increase to 10 million tons.

It is planned to fulfill a large part of production through further intensification of production processes in Siemens-Martin furnaces. The transition to fullbase (magnesite or chromium-magnesite) lining makes possible an increase of up to 12% in steel production as compared with Dinas vaults. Nowadays steel production is inconceivable without magnesite and magnesite brick. That is why one of the important prerequisites for an increase in steel production is to ensure an adequate supply of magnesite and magnesite products and that their quality be high. The XI Congress of the Communist Party adopted the necessary measures for this.

Magnesite -- or "Slovak gold," as it is called by First Secretary of the Communist Party Bacilek -- is, however, also an important export article. This only enhances the importance of further increasing its production.

The mining and output of magnesite products has been steadily increasing since the liberation. Up to 1958, the production of baked magnesite increased by 120,000 tons. The production of magnesite brick was in 1958 eight times higher than that of 1943. Increased production was achieved by better exploitation of existing facilities and the construction of new ones for the production of baked magnesite and magnesite brick.

During 1959-1965 the mining of magnesite and the production of baked magnesite and magnesite brick will get an unprecedented boost. The mining and production of baked magnesite will increase by 1.4 times against the 1958 figure. The production of magnesite brick will increase by 2.7 times against 1958 production.

The expansion of mining and production is based on favourable geological findings. During recent years geological investigators have found considerable deposits of raw magnesite. An increase has been noted in all deposits: Podrecany, the Hnusta-Hacavy district, Lubenik-Jelsava-Ochtina, and Kosice. The greatest and most important deposits are near Kosice. They are estimated to contain several million tons of magnesite.

Increased production requires the construction of new mining facilities. A quarry will be opened at Podrecany and at Kosice; mines at Lubenik, Dubrava, Ochtina, and Hacava-Mutnik. In opening mines it will be necessary to make up for the delay which has occurred particularly during recent years.

Up to now ore has been and still is being mined in old mines. Their size and technical equipment are not up to present requirements as regards quantity and especially quality. Owing to these old methods of mining, the productivity of magnesite mines is very low as compared to the world average.

The magnesite industry will have to make radical changes in production methods in order to increase magnesite production, comply with the requirements of a high retention of MgO and the lowest possible content of undesirable ingredients (CaO and SiO2), reach the world average in productivity, and assure the economical exploitation of deposits so as to achieve the highest possible degree of economical effectiveness in mining.

This is the reason why in magnesite mining we shall in the near future adopt mass-production methods. In quarries this means we shall begin using excavators as soon as possible, underground this means long-wall baring and magazine operation with the use of loaders, completely eliminating manual work. The long-wall and magazine operations will be completely mechanized.

The main problem in and obstacle to the mechanization of mining has been and still is the unsolved question of magnesite sorting. Last year, and specially this year, we have taken the first steps as regards this problem.

The sorting of ore on conveyor bands has been started in Tepla Voda. The sorted magnesite is roasted in an automatic gas shaft furnace, and the magnesite from the mine in a coke automatic furnace. Since November of last year 35% of the ore in the Dubrava quarry has been mined with an excavator. An excavator is also used in the Podrecany quarry.

In 1959, with the collaboration of the UVR (Ore Research Institute) and the VUHK (Metallurgical Research Institute for Refractory Materials), we successfully tested the sorting of magnesite in heavy suspensions. It is of the utmost importance that the Ministry for Heavy Industry, together with the Ministry of Exterior Commerce, purchase this equipment so that sorting can start at the latest in 1961, because the technology of mining and roasting magnesite at the new plant in Kosice is based on this procedure. However, it will be necessary to also investigate other methods of enriching and sorting magnesite. Recently this has successfully been done abroad through flotation.

Expanded and more economical mining and the mining of good-quality ore require the setting up of a good geological service to reliably inform management about the volume, and especially the quality, of deposits and to decide on the most effective mining methods.

Just as in mining, so in expanding the production of sinter, the main task will be to put new facilities into operation. But at the same time, it is necessary to seek out the hidden reserves in existing capacities. Also, as regards magnesite, there are further possibilities of increasing the production of roasted magnesite by reconstructing obsolete furnace aggregates and intensifying the firing process itself.

Further possibilities of increasing the production of existing aggregates are to be found in shortening the time needed for current, medium, and general repair jobs and raising their quality.

The quality requirements of consumers, and especially the required high retention of MgO, renders necessary the use of ashless fuels in rotating furnaces. The powdered coal used up to now lowers the quality of the roasted sinter, because it adds up to 2% to the content of undesirable SiO2 to the detriment of MgO, whose content it lowers.

From the point of view of the mechanization and automatization of production processes we can consider rotating furnaces for roasting magnesite as the most appropriate production system. The trend will probably be towards the widest use of them. This is why it is necessary already now to pay the greatest attention to the technology of firing in rotating furnaces. The main problems are how to use the powdered residue, which would greatly reduce the cost of production; and the use of waste heat, which would also substantially lower the cost of production in rotating furnaces. Abroad, these problems have already been solved. It will depend on our heavy industry to help our magnesite production take a further step in its technical evolution.

It will be necessary to replace old shaft furnaces, which have a low output and require heavy manual work, with more efficient automatic shaft furnaces. It is under consideration to convert the shaft furnaces in Tepla Voda into automatic furnaces. But before this conversion is undertaken, it will be necessary to solve the problem of increasing the capacity of present automatic furnaces. The shaft furnaces in Lovinoban and Kosice are scheduled to be scrapped after 1965.

The production of magnesite brick will increase mainly through the construction of new facilities. Production in Lubenik and Lovinoban will be greatly expanded, and during the Third Five-Year Plan a new plant will be built in Kosice. With the construction of new plants the variety of bricks will increase. It is planned to expand considerably the production of tin-wrapped brick and magnesite-chromium brick and to start producing periclase-spinel, very dense, and other bricks.

In planning a higher production of baked magnesite brick, it is calculated that the capacity of the present tunnel furnaces will be expanded and their output increased through the use of secondary air, rebuilding the furnaces (enlarging the baking band), and eventually using liquid fuel. For baking new types of bricks, especially high density ones, it will be necessary to build tunnel furnaces with a high baking temperature of around 1750° C. The technology of magnesite and chromium-magnesite brick production in our plants is up to the world standard.

But in order to keep pace with technology abroad and to supply our steel men with high-quality products, it will be necessary to equip our plants with modern machinery. At the same time, this will be another step in increasing labour productivity and lowering the production cost of magnesite brick.

The new types of bricks have higher technological requirements. To keep the present mechanical equipment would mean lower productivity and higher costs. Therefore it will be necessary to equip our plants with highly productive mills for fine grinding (vibromills) and mixers. The pressing technique requires new presses with a high output -- 2,000, 3,000, and up to 6,000 tons with automatic removal of the pressed products.

The question of standardization plays an important part in the problem of rendering production economically effective. An increased number of brick types, a lesser use of presses, and frequent change of forms increase the cost of production. But at present there is no authority to take care of standarization. The tasks confronting the magnesite industry are difficult ones. The magnesite men will do everything they can to ensure for our steel men an adequate supply of cheap magnesite products of good quality.

CSO: 3547b-D

# ENRICHMENT OF RAW MAGNESITE IN HEAVY SUSPENSION

/Following is a translation of excerpts from an article by Viktor Popov and Karel Skala in the Czechoslovak periodical Rudy (Ores), Vol. 8, No. 1, January 1960, Prague, pages 12-13./

The Institute for Ore research completed in May 1958 the construction of a heavy-suspension ore-dressing shop in Jilove. The mechanical equipment was delivered by the West German Wedag firm and is the first heavy-suspension equipment for ore in Czechoslovakia.

* * * *

## Mechanical Equipment of the Ore-Dressing Shop

The semi-operational heavy-suspension equipment was delivered by the West German Wedag Bochum firm in late 1957 and started operating in early June 1958.

Besides electromotors, a complete mechanical set-up was delivered which ties in the ore-crushing line with the bunker section. It was constructed according to the plans of the Ore Project.

The crushing and sorting line for raw materials is composed of the following machines:

| | KW consumption |
|---|---|
| Jaw crusher for heavy crushing | 30 |
| Vibrating screen 600 x 1350 | 1.7 |
| Type V-3-2N jaw crusher for second-degree crushing | 20 |
| Type VM2 roller crusher | 7.5 |
| Type VT three-tiered vibrating screen | 2.2 |
| Rubber conveyors | 28.4 |

After heavy crushing (under 200 mm) the ore is conveyed on rubber belts to the vibrating screen of the appropriate mesh (40, 60 mm) and the residue is subjected to second-degree crushing. The crushed raw material, together with the screened material, is conveyed to the three-tiered vibrating screen, which is placed over the storage space.

Storage is done in a separate building with four storage tanks for raw ore. The capacity of the storage tanks is about 30 tons of raw ore. To these are connected two storage tanks of a total capacity of about 40 tons of semi-products. The connection is made by rubber conveyors of various lengths.

* * * *

Following is a more detailed description of the machines with base space and current consumption:

| | Base | KW consumption |
|---|---|---|
| 2 vibrating screens for washing and draining ore, 500 x 1500 | 5 | 2.4 |
| Storage tank with vibrating ore conveyor (tank 1000 x 1000) | 5-4 | 0.7 |
| Heavy-suspension separator with siphoning wheel (Heberradscheider) ∅ 2000, width 315, suspension content 0.5 $m^3$ | 3 | 1.15 |
| Siphoning and spraying vibrating screen 810 x 4200, mesh 1 mm | 2 | 4.4 |
| Conic tank for operational suspension, ∅ 1200, capacity 0.75 $m^3$ | 1 | |
| 2 Wedag centrifugal pumps (one reserve one), type P980-80, capacity 30 $m^3$/hr to a height of approx. 10 m of operational suspension 3.5 density | 1 | 30 |

Circuit of diluted suspension

| | | |
|---|---|---|
| Conic tank for diluted suspension, ∅ 1800, capacity 1.7 $m^3$ | 1 | |
| Wedag centrifugal pump, type P280-80, capacity 40 $m^3$/hr to approx. 10 m of diluted suspension density 1.4 | 1 | 7.5 |
| Magnetising coil ∅ 80, length 800 for 110 v direct current | 5 | |
| Wet-band electromagnetic separator, type GBN 615, belt width 900, magnetic field dimension 600 x 1500 for 110 v direct current | 4 | 2.4 |
| Simples spiral sorter, ∅ of spiral 400, length 3800, for condensing regenerated ferrosilicide | 3 | 3 |
| Demagnetizing coil ∅ 80, length 800, for 220 v alternate current | 2 | |

The described equipment is for dressing grains of 6 mm or more. Smaller grains (under 6 mm) are dressed on a hydrocyclone line which uses the same machines with the exception of the sorter and spiral separator. In addition, there are the following:

| | |
|---|---|
| Mixing tank 500 x 500 x 1300 for mixing the suspension with raw ore | 3 |

| | | |
|---|---|---|
| Wedag, centrifugal pump, type P9/80-80 | 3 | 30 |
| Hydrocyclone with exchangeable nozzles, ∅ 100 mm | 3 | |
| Simplex spiral sorter, ∅ 400, length 3800 | 3 | 3 |

All the equipment of the dressing shop is set up for alternate use, i.e., either the separator or the hydrocyclone can be operated. If the operation is interrupted, the suspension is pumped into reserve tanks (capacity 1 $m^3$), one of which is for the suspension for the separator and the other for the suspension for the hydrocyclone.

The density of the suspension is continuously checked by a diferential densimeter whose measuring tubes are immersed in the operational suspension tank. The required density of the suspension is maintained manually either by adding water or regenerated ferrosilicide from the spiral sorter, which functions as a condensing device.

## Preparation of Ferrosilicide Suspension

To prepare the ferrosilicide suspension, ferrosilicide made by the VZKG was used. It has the following composition: Fe = 80.13%, Si = 14.83%, C = 1.25%, the remainder consisting of up to 100% Mn, Ti, P, S, etc. The specific weight of the dry powder is 6.8 $g/cm^3$.

CSO: 3547c-D

DIFFICULTIES IN PRODUCING CASTINGS RETAINING THE REQUIRED DIMENSIONS

/Following is a translation of an excerpt from an article by Vladimir Kotoul and Karel Heczko in the Czechoslovak periodical Slevarenstvi (The Foundry), Vol. 8, No. 1, January 1960, Prague, page 10./

b) Differences in the time castings remain in molds.

A prematurely removed casting continues to shrink freely, which reduces its final dimensions. The TOS enterprise (Prague-Holesovice) corrects this defect through the use of the new semiautomatic CLP 8545 machine, which is similar to the LP Polak 600 machine, and the use of the newly-developed CLP 8030 machine, which is similar to the LP Polak 900 machine. With these machines it is possible to set exactly the time during which the mold remains sealed. With older machines which do not have the semi-automatic H 12 distributor, attempts have been made to make castings by means of a time-delay relay preventing the premature opening of the mold. It is thus possible to time exactly how long the casting stays in the mold.



- END -